Amendments to the Claims

This listing of Claims will replace all prior versions, and listings, of Claims in the application.

Listing of Claims:

1-22. (Canceled)

23. (Currently Amended) A computer-readable medium having computer-executable instructions ~~module~~ for calculating the luminance value from an input image data, said input image data comprising a red (R) digital data value, a green (G) digital data value and a blue (B) digital data value, said luminance value calculation ~~module~~ comprising:

~~a red left shift by one module, said red left shift by one module~~ shifting said R digital data value to the left by one digital place value, producing a R intermediate digital data value;

~~a green left shift by two module, said green left shift by two module~~ shifting said G digital data value to the left by two digital place values, producing a G intermediate digital data value;

~~a first adder,~~ adding said R intermediate digital data value to said B digital value, producing a first intermediate value;

~~a second adder,~~ adding G digital value to said G intermediate digital data value, producing a second intermediate value;

~~a third adder,~~ adding said first intermediate value to said second intermediate value, producing a third intermediate value; and

~~a right shift by three module, said right shift by three module~~ shifting said third intermediate value by three digital place values, producing said luminance value.

24. (Currently Amended) The computer-readable medium ~~module for calculating said luminance value~~ of Claim 23 wherein said luminance value calculation

further comprises performing ~~module substantially performs~~ the calculation Y = (2*R + 5*G + B) / 8, where Y is substantially the luminance value for said input image data.

25. (Currently Amended) A computer-readable medium having computer-executable instructions ~~module~~ for calculating the hue angle of an input image data, said input image data comprising a red (R) digital data value, a green (G) digital data value and a blue (B) digital data value, said hue angle calculation ~~module~~ comprising:

~~a module for~~ calculating a luminance value from said input image data, producing a Y digital value;

~~a module for~~ calculating intermediate values x = absolute values of B-Y and y = absolute value of R-Y;

~~a module for~~ swapping intermediate values x and y if y > x;

dividing y by x ~~a y divided by x module~~;

accessing an action look-up table to provide correction bits for performing calculations within the first subset of hue angle space; and

accessing an arctangent look-up table, said arctangent table producing an intermediate hue angle value.

26. (Currently Amended) The computer-readable medium ~~module for calculating the hue angle~~ of Claim 25 wherein said ~~module for~~ calculating of a luminance value comprises performing ~~performs~~ the calculation Y = (2*R + 5*G + B) / 8, where Y is substantially the luminance value for said input image data.

27. (Currently Amended) The computer-readable medium ~~module for calculating the hue angle~~ of Claim 25 wherein said ~~module for~~ calculating of a luminance value comprises:

~~a red left shift by one module, said red left shift by one module~~ shifting said R digital data value to the left by one digital place value, producing a R intermediate digital data value;

~~a green left shift by two module, said green left shift by two module~~ shifting said G digital data value to the left by two digital place values, producing a G intermediate digital data value;

~~a first adder,~~ adding said R intermediate digital data value to said B digital value, producing a first intermediate value;

~~a second adder,~~ adding G digital value to said G intermediate digital data value, producing a second intermediate value;

~~a third adder,~~ adding said first intermediate value to said second intermediate value, producing a third intermediate value; and

~~a right shift by three module, said right shift by three module~~ shifting said third intermediate value by three digital place values, producing said luminance value.

28. (Currently Amended) The computer-readable medium ~~module for calculating the hue angle~~ of Claim 25 wherein said action look-up table provides corrections with the first octant of said hue angle space.

29. (Currently Amended) A computer-readable medium having computer-executable instructions ~~module~~ for converting an RGB input image data into an RGBW image data, said conversion ~~module~~ comprising:

~~a module for~~ calculating the hue angle of said RGB input image data;

~~a module for~~ selecting the chromaticity triangle of said RGB input image data based upon said hue angle, said chromaticity triangles being selected from one of a group, said group comprising RGW, GBW and BRW;

~~a module for~~ selecting a multi-primary matrix based upon said chromaticity triangle;

~~a module for~~ multiplying said multi-primary matrix to said RGB input image data to produce an intermediate RGBW image data value; and

wherein further said multi-primary matrix being selected from one of a group, said group comprising:

168 0 -40 128 0 0 168 -40 0

0 168 -40 -40 168 0 0 128 0
0 0 128 ; -40 0 168 ; and 0 -40 168.

30. (Currently Amended) The computer-readable medium ~~module for converting RGB input image data into an RGBW image data~~ of Claim 29 wherein said group of said multi-primary matrices correspond to RGW, GBW, and BRW chromaticity triangles respectively.

31. (Currently Amended) The computer-readable medium ~~module for converting RGB input image data into an RGBW image data~~ of Claim 29 wherein the conversion further comprises ~~comprising~~:

~~a module for~~ detecting out-of-gamut image data values;

~~a module for~~ determining the maximum color component that is out-of-gamut; and

accessing an inverse look-up table for providing a scaling factor to apply to said out-of-gamut image values.

32. (Currently Amended) The computer-readable medium ~~module for converting RGB input image data into an RGBW image data~~ of Claim 29, wherein the conversion further comprises ~~comprising~~:

~~a module for~~ subpixel rendering said RGBW image data values; and

accessing an output gamma look-up table for providing gamma values to be applied to image data values from said subpixel rendering module.